

**FLOOD
General Scope of Work
“ON-CALL” Engineering Services**

DESCRIPTION OF THE ARCHITECT-ENGINEER (A/E) SERVICES

I. INTRODUCTION

The Orange County Flood Control District (DISTRICT) requires supplemental engineering resources to meet workload demands and project scheduling commitments. In order to supplement its existing resources, the DISTRICT intends to issue an "on-call" Architect-Engineer (A/E) services contract for use by DISTRICT on an "as-needed" basis. No specified amount of work is guaranteed to the A/E. However, the amount of contracted work that will be required on an "as-needed" basis shall not exceed \$200,000 unless otherwise amended by the DISTRICT.

II. PURPOSE

The purpose of this Scope of Work is to describe the "on-call" professional and sub-professional engineering support services to be provided as part of this AGREEMENT, and to describe the administrative process of the AGREEMENT. Support services may include, but are not limited to planning, plan checking, engineering (hydrologic, hydraulic, structural, geotechnical, sediment transport, utility, corrosion, and right of way), CADD and hand drafting, hazardous materials assessment (HMA), surveying, report writing, environmental (CEQA/NEPA) and regulatory permit services, and cost/quantity estimation.

III. DESCRIPTION OF WORK

A. Planning and Engineering

The planning and engineering support services may include a specific service such as hydrology/hydraulic (H&H) analysis, right-of-way engineering (ROWE), HMA, etc. or in combination with other planning and engineering services for preparation of a comprehensive report, such as: a project report, technical study, or preparation of plans, specifications and estimates (PS&E). Such specific services may include, but not be limited to the following:

1. Hydrology

The work to be performed by A/E may include, but shall not be limited to, performing hydrologic studies in accordance with the 1986 Orange County Hydrology Manual and its Addendum, or other criteria as specified by the DISTRICT. These tasks may include performing hydrography studies and reviewing existing hydrologic data/studies provided by DISTRICT. The work shall be performed utilizing HEC-1 software, WMS software, manual hand computations, AES analysis or similar. A/E shall perform such hydrology related work to produce a final hydrology report(s), which includes a summary of hydrologic information, a tabulation of the drainage areas, return frequencies and discharges for the watershed and other related information. All reports will need to be submitted for review and approval by DISTRICT staff.

2. Hydraulic Engineering

A/E as required, will perform preliminary and/or design level hydraulic analyses of flood control facilities and local drainage systems using, but not limited to, HEC-RAS (HEC-2), WSPG, Storm Program, Microsoft Excel, and manual "hand" calculations. The analysis requested may include, but shall not be limited to, existing deficiency and capacity studies, development of design water surface elevations, development of preliminary and ultimate facility design alternatives, construction phasing schedules, and preparation of PS&E. Hydraulic controls for tributary channels and DISTRICT committed water surface elevations (if not requested as part of A/E's duties) will be provided where available. Available reports and preliminary engineering studies performed by DISTRICT will be provided to A/E.

Geotechnical, survey, environmental, utility, and record drawing information (if not part of A/E's requested services and if available) will be provided by DISTRICT.

The work to be performed by A/E may include, but is not limited to the following:

- a. Hydraulic analysis and generation of hydraulic gradelines (HGL) for existing and future condition design alternatives. Preparation of exhibits indicating the HGL on plans, and profile sheets for existing and future condition alternatives to be presented in report(s).
- b. Hydraulic analyses for conveyance of design discharges through existing bridge and culvert structures, including: street, freeway and railroad crossings.
- c. Identification of local drainage facilities and catch basins, including a listing of major inlets and committed water surface elevations.
- d. Determination of capacities of local drainage facilities.
- e. Identification of alternatives, including channel alignment adjustments and right-of-way requirements.
- f. Preparation of material quantity and cost estimates for each alternative that is studied with unit prices identified. Comparisons between the costs of alternatives should be included where appropriate.
- g. Identification of major utilities, both existing and proposed (if available, may be furnished by DISTRICT), and utility conflicts of those facilities specifically requiring relocation (with the party responsible for relocation also being identified). Utility relocation costs attributable to DISTRICT shall be included in cost estimate summaries.
- h. A general discussion of soil conditions and any unique findings. Of particular interest are: ground water, perched water tables and the foundation conditions for the facilities.
- i. Identification of known environmental considerations related to each channel design alternative.
- j. Identification of any existing agreement obligations or need for new agreements required, permits needed for approval from other agencies or cities.

- k. Identification of unique maintenance problems associated with the alternatives and determination of appropriate maintenance costs based on the project report or A/E's independent findings.
- l. Recommendation of a preferred alternative for ultimate improvements, and identification of a possible and logical sequence of implementation (aka: construction phasing).
- m. Identification, analysis, recommendation, and/or design of existing and/or proposed retarding, retention, water quality, and/or sediment basin alternatives.
- n. A determination of existing condition and ultimate condition floodplains in a manner meeting the approval of DISTRICT and the Federal Emergency Management Agency (FEMA).
- o. Attendance at public meetings as required by DISTRICT to gather information from residents and local agencies concerning local flooding and to assist DISTRICT in answering questions. A/E may be required to conduct public or in-house seminars for DISTRICT staff and prepare public presentations.
- p. Preparation of Plans and Special Provisions in accordance with the DISTRICT's Design Manuals and other approved publications as needed to perform the work in a manner meeting the approval of DISTRICT staff. A/E shall utilize the RDMD Specifications Library and "Boiler Plates", and shall prepare the PROJECT's contract documentation to conform to the current "Reduced Plans and Special Provisions" format. Boiler Plate specifications will be provided by DISTRICT.
- q. Preparation of final design level hydraulic, civil, structural, hydrologic, geotechnical, sediment transport, utility, corrosion, and right of way engineering in accordance with DISTRICT's Design Manual and other DISTRICT specified criteria (Caltrans, Corps, etc.).
- r. During the advertisement, award and construction phase of the project, A/E shall make itself available to DISTRICT personnel to answer questions regarding the PROJECT design, and preparation of the plans and specifications.
- s. Field and/or plant inspection of construction and/or fabrication activity for its conformance to the Plans and Special Provisions
- t. Preparation and submission of computer CDs or DVDs containing all relevant information and computer runs of all alternatives studied.

3. Geotechnical

DISTRICT shall furnish previous soil investigation reports or studies to A/E where available. A/E shall independently determine if further soil investigations are required, and shall discuss the number, locations and types of soil tests needed with DISTRICT. In the event of disagreement, DISTRICT's decision shall be final. If DISTRICT determines that additional geotechnical investigations are required, A/E may perform such work or employ special consultants to

accomplish the work. All costs associated with subcontracting for such services will be reimbursed subject to Section V, "A/E Compensation, Reimbursable Items," of this scope of work.

The geotechnical services may include, but not limited to: design and recommendations for mechanically stabilized earth (MSE) retaining walls, soil nailing, soil reinforcement, etc.; development and implementation of field investigation plan involving field data collection as deemed necessary; development of laboratory testing program to conduct soils surface and subsurface characterization tests as applicable to the needs of the project and performance of such tests; development of seismic analysis and design criteria in accordance with code or other design requirements; recommendations for allowable soil bearing pressure and design of foundations; embankment and excavation procedures; settlement and consolidation analyses; compaction recommendations; lateral, active, and passive earth pressures; dewatering, subsidence, landslide mapping, slope stabilization, sudden drawdown, soil corrosion, erosion, sedimentation control and other applicable design criteria as deemed necessary.

4. Structural Engineering

A/E may be required as necessary to perform structural design for purposes such as final plans and specifications. Designs include, but may not be limited to retaining walls, trapezoidal and rectangular concrete channels, reinforced concrete box conduits, sheet piles, bearing piles, tie-backs and deadmen, bridge crossings, pump stations and appurtenant structures, grade stabilizers, drop structures, and spillways including transition and tie-in details.

A/E shall conform to the requirements, standards and guidelines of DISTRICT's, Flood Control Design Manual, current edition, including all addenda thereto, and/or additional design criteria as specified by DISTRICT staff.

5. Traffic Engineering

A/E may be required to perform traffic studies that shall include, but not be limited to: traffic count, traffic management plan, traffic control, traffic projection for the base year construction, cost estimates, etc. A/E shall follow the Orange County Highway Design Manual, Caltrans' Highway Design Manual, Highway Capacity Manual or other guidelines acceptable to DISTRICT.

B. Environmental Assessment

A/E may be required to: provide a biological assessment and an environmental analysis of the impact of proposed project alternatives on vegetation and wildlife in sufficient detail to provide insight into potential impacts and associated mitigation measures for each alternative; provide file documents required for environmental determination under the California Environmental Quality Act (CEQA) or National Environmental Protection Act (NEPA) with RDMD/Planning & Development Services Division/Environmental Planning Section; and perform environmental analyses at a conceptual level to determine whether or not a formal Environmental Impact Report (EIR) may be required. Biological assessments, environmental analyses, and report preparation shall be in a format suitable for submittal to the California Department of Fish & Game, the Army Corps of Engineers/U. S. Fish and Wildlife Service, California Regional Water Quality Control Board, and/or California Coastal Commission.

D. Permits

A/E may be required to prepare and submit permit applications and process these permits through Cities, Caltrans; regulatory agencies, such as: the California Department of Fish and Game, the U.S. Army Corps of Engineers, the Coastal Commission and any other applicable regulatory permitting agency. The work may include, but is not limited to: preparation of permit applications, submittal of permits, coordination between DISTRICT and the regulatory agencies, and attendance at meetings. No such permit related work shall be accomplished with any of the Agencies without first obtaining DISTRICT's approval on matters relevant to such permits.

C. Surveys

DISTRICT will furnish existing as-built plans and/or previous field data available in its files. For work prepared by A/E, A/E shall be responsible for determining if additional surveys such as cross-sections, topography and spot elevations are required. In the event of disagreement on the justification, the decision of DISTRICT shall be final. DISTRICT may request additional survey services related or unrelated to work conducted by A/E. If DISTRICT determines that additional survey data are required, A/E may perform such work or employ special consultants to accomplish the work. All costs associated with subcontracting for such services will be reimbursed subject to Section V, "A/E Compensation, Reimbursable Items," of this scope of work. All surveys obtained from outside sources shall be stamped by a Registered Land Surveyor and be performed to the standards and criteria of the Orange County Surveyor.

E. Right of way services

A/E may be required to prepare, acquire, and/or review legal descriptions, record of survey, easement deeds, Title Insurance, and other related right-of-way documents pertinent to the project. A/E's services may also be required to prepare, acquire, and/or review documents necessary to acquire rights of way necessary for the implementation of DISTRICT projects. If DISTRICT determines that such right of way and real estate services are required, A/E may perform such work or employ special consultants to accomplish the work. All costs associated with subcontracting for such services will be reimbursed subject to Section V, "A/E Compensation, Reimbursable Items," of this scope of work. All right of way and real estate services obtained from outside sources shall conform to the standards and practices of the RDMD/Right of Way Engineering Section and/or RDMD/Real Estate Services Section.

F. Utility Relocation

A/E may be required to perform engineering services related to: determination of utility disposition, ownership, and superior rights for all utilities within project area; determination of utility location and depth including conducting pot-holing operations if necessary; and design and/or coordination of utility relocations within the project area. The task may include, but not be limited to research, pot-holing, surveying, design, cost estimates, permits, agreements, PS&E (portion related to the relocations), coordination with utility companies and other agencies.

If DISTRICT determines that such utility services are required, A/E may perform such work or employ special consultants to accomplish the work. All costs associated with subcontracting for such services will be reimbursed subject to Section V, "A/E Compensation, Reimbursable Items," of this scope of work. All utility services obtained from outside sources shall conform to the standards and practices of the RDMD/Utilities Section.

G. Hazardous Waste

A/E may be required to conduct an environmental site assessment for the purpose of hazardous material assessment, including but not limited to review previous environmental documents pertinent to the project, field investigation, preparation of sampling plan, collection of soil and groundwater samples, analyzing soil and groundwater samples for possible contamination, and preparation of report (HMA Phase I and/or Phase II) and recommendation. The task includes obtaining permit and coordinating with utility companies and other agencies (Caltrans, cities, etc.). A/E shall recommend methods for possible waste and ground water disposal approved by OSHA and other agencies. A/E should prepare the most efficient and cost effective method of disposal.

If DISTRICT determines that such HMA services are required, A/E may perform such work or employ special consultants to accomplish the work. All costs associated with subcontracting for such services will be reimbursed subject to Section V, "A/E Compensation, Reimbursable Items," of this scope of work. All HMA services obtained from outside sources shall conform to the standards and practices of the RDMD/Environmental Resources Section.

H. Plan Checking

1. A-E shall review each of the developer submitted plans and specifications which herein after shall be called a "PROJECT" for the following:

a) Check for adequacy of the submittal and compliance with DISTRICT/County standards and criteria, regulatory permit conditions, mitigation measures and applicable federal, state or County requirements, "the standard of ordinary care" and technical correctness.

b) Safety issues:

The flood control plan submittals shall be reviewed for adherence to County/DISTRICT standards of design criteria and in cases where strict adherence to the standards of design would be impractical or unreasonable, identify deviations and make sure they are in accordance with good engineering practice and the public health and safety.

c) Maintenance issues:

Maintenance being an ongoing County/DISTRICT cost, the plans should be reviewed for maintenance cost effectiveness.

d) Drainage:

Local drainage should be reviewed relative to maintenance and safety. Hydraulics and Hydrology should be checked.

2. A-E shall review submittal to see if all required parts constituting a complete bid package is provided. Typical items to be reviewed are:

a) Detail sheets:

Review plans for adequacy, clarity and completeness; particular attention should be paid to details known to cause hydraulic, structural, serviceability or maintenance problems.

b) Calculations:

Review design criteria, method of analysis, use of DISTRICT/County standards.

c) Review Structural Design:

Review design criteria, method of analysis, use of DISTRICT/County standards.

d) Review materials specified for conformance to current practices and appropriateness use.

e) Review Geotechnical submittals for conformance with design.

f) Hydraulics:

Review hydraulic and hydrologic computations for conformance with County/DISTRICT standards.

I. Exhibits and Appendices

The A/E may be required to prepare the following items:

1. Plan and profile sheets exhibits for the original conditions as well as all alternatives reflecting hydraulic grade lines for existing capacity and 100-year storm discharges. Construction plans and/or detail exhibits sufficient to conduct design seminars and public meetings. All plans and exhibit sheets shall conform to the RDMD CADD guidelines and standards, and shall be computer plotted on mylar or ink drawn on standard 22" X 36" mylar sheets. A/E will reproduce the plans to 1/2 size (11"x17") for complete legibility at the reduced size. A/E may prepare plans on mylar with topography screened on plan view. A title sheet with index reference shall be provided.
2. Pertinent photographs to supplement information in the project report, project study, and/or design report.
3. An 8-1/2 x 11" location map and vicinity map.
4. Cost comparison of channel design alternatives and/or engineer's quantity and cost estimates.
5. Right-of-way maps, if necessary.

J. Design Requirements and Criteria

1. Engineering

A/E shall conform to the requirements, criteria, standards, and guidelines of the DISTRICT's, Flood Control Design Manual, including all Addenda thereto, the County of

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Orange, Local Drainage Manual, the US Army Corps of Engineers, EM Manuals (where applicable), and all references and standards referred to therein. In addition to the above, A/E may be required to use other manuals such as the Flood Insurance Study Guidelines and Specifications for Study Contractors, FEMA 37 and other such manuals where appropriate. All manuals used shall be the most up-to-date and current edition. Any deviation from the above listed materials shall be approved by DISTRICT staff prior to start of work and/or notice to proceed.

Computer programs used for hydraulic modeling, such as HEC-RAS (HEC-2), or WSPG shall be compatible with DISTRICT's computer equipment, and A/E shall receive DISTRICT staff approval of any program before it is used.

Computer programs used for structural engineering shall be compatible with DISTRICT's computer equipment and A/E shall receive DISTRICT staff approval of any program before it is used.

2. Hydrology

A/E shall conform to the requirements, standards, and guidelines of the Orange County Hydrology Manual, including all Addenda thereto and all references and standards referred to therein.

3. Drafting

Plan and profile sheets shall be drawn using the criteria as set forth by DISTRICT staff. A/E may only reference on the plans those standard details as included in the RDMD Standard Plans, latest Edition. All other standard plans to be referenced must be approved by DISTRICT staff. A/E shall submit a CD or DVD disk containing all plans and profile sheets which shall be compatible with the CAD drafting system used by DISTRICT and shall be suitable for inclusion in engineering reports.

4. General

All work to be performed for this PROJECT must be accomplished under the direct supervision and responsible charge of a Professional Civil Engineer, Mechanical Engineer, and/or Electrical Engineer registered by the Department of Consumer Affairs in the State of California. The Professional Engineer shall affix his/her stamp and sign all to the engineering plans, analyses, studies, reports, and any other engineering documents prepared.

A/E shall be responsible for obtaining all the above-listed references and manuals, except where provided for in Section VI, "DISTRICT Supplied Items," of this scope of work.

A/E may additionally be required to prepare all reports, computations, plans and all other work products in metric units.

IV. SCHEDULE OF WORK/MEETINGS

A/E shall submit a schedule for completion of all required work along with a list of deliverables to DISTRICT within one week of being notified by DISTRICT to begin work. The schedule shall be approved by the Director of RDMD or his designee. This schedule shall allow sufficient time and include meetings with RDMD staff to review the work progress, provide technical and policy direction, resolve problems and insure adherence to the work completion schedule. Within five working days of each meeting, A/E shall submit a memorandum summarizing the results of the meeting to RDMD staff for concurrence.

V. A/E COMPENSATION

A. ENGINEERING:

DISTRICT will describe the work to be performed and the method of payment, which may be a negotiated lump sum or at an hourly rate (time and materials) with a not-to-exceed amount. The work to be performed and the payment method must be approved in writing by the DIRECTOR or his designee prior to start of work. A/E must submit billing rates for all employees at the time they submit their proposal which shall be attached hereto as Exhibit B.

A/E may be required to submit monthly invoices for services including those provided by others, if any. Total payment to A/E invoiced on a monthly basis shall not exceed the total authorized amount. A/E's monthly invoices shall be subject to DISTRICT staff approval in accordance with progress of work and based on the approved Project Schedule, if any.

A/E shall include with billings the PROJECT title, agreement number, and work order number, total dollar cost of AGREEMENT, dollar amount of invoice, remaining dollar amount on AGREEMENT. For time and material work, the invoice shall show breakdown of the performed task, time spent on PROJECT by each staff member by name, and hourly rate charged and costs totaled for each staff member. For lump sum work A/E shall show percent completion at the time of the invoice. A/E shall also show on the invoice a complete accounting for Reimbursable items as described below.

Payment to A/E shall be within 30 days of receipt by DISTRICT of an approved invoice. Ten percent (10%) shall be withheld each month from the cumulative amount due to A/E on each separate item of work. Payment of the remaining ten percent (10%) on each separate item of work shall be made upon acceptance and approval of said item of work by the DIRECTOR or his designee.

B. EXTRA WORK:

Extra work not described in this AGREEMENT may be required. In the event DISTRICT requires such work, additional compensation for this work shall be agreed upon by A/E and DISTRICT prior to commencing any work. The appropriate fee and performance of such work shall be authorized in writing by the DIRECTOR or his designee, and shall not exceed ten percent (10%) of the authorized amount.

In the event extra work is required, the schedule of fees previously submitted by A/E in the proposal will determine the basis of payment for extra work. Schedule of Fees shall be included in the AGREEMENT as Exhibit B.

C. Reimbursable ITEMS OF WORK:

Reimbursable items of work include non-salary expense items not included in the scope of work but necessary for the work, authorized in writing in advance by the DIRECTOR or his designee. Reimbursable direct costs may include the following:

1. Identifiable communication expense, such as long distance telephone and FAX, telegraph, cable express charges, and postage, other than for general correspondence required in the performance of the work.
2. Identifiable printing or reproduction services required in the performance of the work.
3. Third-party services directly applicable to the work such as geotechnical services, surveying services, special legal and accounting expenses, special consultants, borings, outside laboratory charges, commercial printing and binding and similar costs that are not applicable to general overhead. Compensation for this paragraph shall not exceed twenty percent (20%) of the authorized amount.

NOTE: computer expense reimbursement is for third-party services only. A/E's in-house computer time is not considered a Reimbursable item and should be included as part of A/E fee, listed in Exhibit B.

4. Materials used for in-house testing, laboratory and field supplies.
5. Permit fees, application fees, and filing fees.
6. Mileage and parking fees for field work and meetings outside Los Angeles and Orange Counties.

Payment to A/E shall be conditioned upon approval by DISTRICT staff and A/E providing an invoice with copies of the tickets, receipts, or other proof of payment by A/E.

D. ITEMS NOT CONSIDERED REIMBURSABLES ARE AS FOLLOWS:

1. Hotel and meal expenses for the A/E's employees being utilized during the course of working on this project.
2. Vehicle rental and equipment use and rentals.
3. Computer Aided Drafting and Design, computerized engineering software and subsequent equipment operation related to the production of exhibits, reports, submittals and study documentation shall be considered included in the cost of general overhead and included in the hourly personnel rates for this project.
4. General overhead costs such as accounting, computer rentals, and items generally required for the basic operations of daily business directly related to this project.

5. Standard plans, standard specifications, reference manuals, books, periodicals, or other written materials.
6. Local telephone and FAX.

VI. DISTRICT SUPPLIED ITEMS

DISTRICT shall provide to A/E the following if and/or when available:

1. Record Drawings,
2. Survey information provided by County Surveyor,
3. Geotechnical information on file at the County, relating to specific channels,
4. Utility information regarding specific channels, and
5. Right-of-way maps if necessary.

VII. CONTRACT TERMINATION

DISTRICT reserves the right to terminate the contract with A/E at any time. If during the course of work, in the opinion of DISTRICT, A/E appears to be performing in a manner deemed unsatisfactory; the contract shall be terminated.

Unsatisfactory performance includes, but not limited to, the following:

1. Slow performance of work, failure to meet project schedule(s)
2. Poor quality work, numerous errors on submittals
3. Negligence or incompetence in engineering design (DISTRICT staff opinion, not legal interpretation or requirement)
4. Excessively high invoicing of reimbursable items or staff time
5. Difficulty of A/E staff to effectively interface with DISTRICT representatives.

VIII. STATEMENT OF QUALIFICATIONS (SOQ) SUBMITTAL REQUIREMENTS

The submittal requirements are outlined in the RFQ for the on-call engineering service that is a companion document to this. Please note that the information contained within the SOQ shall be submitted in the order and to the format as described within the RFQ.

All STATEMENT OF QUALIFICATIONS for **FLOOD** are due by **4:00 p.m. (Local Time) on February 14, 2006**, and shall be mailed or hand delivered to:

Phil Jones, P.E., Manager
OC/RDMD Flood Control Design
300 N. Flower Street, 7th Floor
Santa Ana, CA 92702
(714) 834-2599